

The 594 patent does not disclose or suggest a method of manufacturing a semiconductor device including, inter alia, applying a pressure to a semiconductor assembly by at least one support pin so as to cause a stress in the lead frame, sealing the semiconductor assembly with a resin injected into the cavity from a resin injection port of the mold, the pressure applied by the at least one support pin preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity, and pulling the support pin from the cavity into the mold before the resin is cured to release the semiconductor from the pressure applied by the support pin, as recited in claim 1. Further, the 933 patent does not disclose or suggest a method of manufacturing a semiconductor device including, inter alia, applying a pressure to a heat radiator by at least one support pin so as to cause a stress in the lead frame, injecting a resin into the cavity from a resin injection port, the pressure applied by the at least one support pin preventing the heat radiator from being lifted up or pushed down by the resin when the resin is injected into the cavity, and pulling the support pin from the cavity into the mold before the resin is cured to release the heat radiator from the pressure applied by the support pin, as recited in claim 12. Further, the 594 patent, whether alone or in combination with the 548 patent, does not disclose or suggest a molding device for a semiconductor device including, inter alia, an actuator which moves the support pin in a direction of the axis of the support pin such that during injecting the resin into the cavity the support pin applied a pressure to the semiconductor assembly so as to cause a stress in the lead frame, the pressure applied by the at least one support pin preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity, and such that the support pin releases the semiconductor assembly from the pressure applied by the support pin after the resin is injected before the resin is cured, as recited in claim 15.

As discussed during the September 10 interview, the holding member in the 282 patent does not apply pressure to the semiconductor assembly. According to the claimed invention, pressure is applied to the semiconductor assembly by support pins to move the assembly in a direction away from the previous position of the contact portion of the support pins so that the support pins are pushed toward the mold by the semiconductor assembly due to the elasticity of the wires connecting the leads of the lead frame to the semiconductor chip and the suspension leads. An advantage provided by this feature is that the semiconductor assembly is not lifted up by the resin even if the resin flows into the cavity under high pressure.

Claims 1, 12 and 15 are amended as suggested by Examiner Smith during the September 10 interview to reflect the above-mentioned advantages of what is claimed.

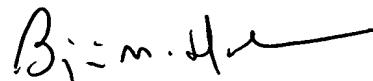
For at least these reasons, it is respectfully submitted that claims 1, 12 and 15 are patentable over the applied references. The dependent claims are likewise patentable over the applied references for at least the reasons discussed as well as for the additional features they recite. Applicant respectfully requests that the rejections under 35 U.S.C. §102 and §103 be withdrawn.

II. Conclusion

In view of the foregoing, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,



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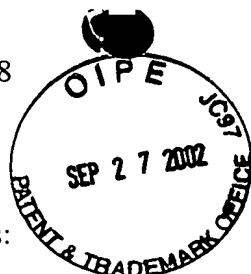
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Attachment:
Appendix

Date: September 27, 2002

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APPENDIX

Changes to Claims:

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The following is a marked-up version of the amended claims:

1. (Twice Amended) A method of manufacturing a semiconductor device comprising:

placing a semiconductor assembly in which a semiconductor chip is secured to a die pad of a lead frame in a cavity of a mold;

applying a pressure to the semiconductor assembly by at least one support pin so as to cause a stress in the lead frame;

sealing the semiconductor assembly with a resin injected into the cavity from a resin injection port of the mold, the pressure applied by the at least one support pin preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity; and

pulling the support pin from the cavity into the mold before the resin is cured to release the semiconductor assembly from the pressure applied by the support pin.

12. (Twice Amended) A method of manufacturing a semiconductor device comprising the steps of:

supporting a heat radiator placed in a cavity of a mold with at least one support pin;

placing a die pad of a lead frame to which a semiconductor chip is secured on the heat radiator;

closing the mold;

applying a pressure to the heat radiator by at least one support pin so as to cause a stress in the lead frame;

injecting a resin into the cavity from a resin injection port, the pressure applied by the at least one support pin preventing the heat radiator from being lifted up or pushed down by the resin when the resin is injected into the cavity; and

pulling the support pin from the cavity into the mold before the resin is cured to release the heat radiator from the pressure applied by the support pin.

15. (Twice Amended) A molding device for a semiconductor device comprising:
a mold which is capable of being opened or closed and is provided with a cavity for placing a semiconductor assembly which comprises a semiconductor chip secured to a die pad of a lead frame;
a resin injection port provided to the mold for injecting a resin into the cavity;
at least one support pin provided in the cavity such that the support pin is able to enter into or be pulled out of the cavity to come in contact with the semiconductor assembly in the cavity; and
an actuator which moves the support pin in a direction of the axis of the support pin such that during injecting the resin into the cavity the support pin applies a pressure to the semiconductor assembly so as to cause a stress in the lead frame, the pressure applied by the at least one support pin preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity, and such that the support pin releases the semiconductor assembly from the pressure applied by the support pin after the resin is injected before the resin is cured.